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**REMOVAL SITE EVALUATION
DECONTAMINATION OF VARIOUS AREAS OF
EXISTING, FIXED OR REMOVABLE
CONTAMINATION JUNE 26, 1991**

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REMOVAL SITE EVALUATION

**DECONTAMINATION OF VARIOUS AREAS OF EXISTING,
FIXED OR REMOVABLE CONTAMINATION**

June 26, 1991

**U.S. Department of Energy
Feed Materials Production Center
7400 Willey Road
Fernald, Ohio 45030**

REMOVAL SITE EVALUATION

DECONTAMINATION OF VARIOUS AREAS OF EXISTING, FIXED OR REMOVABLE CONTAMINATION

INTRODUCTION

Since 1952, the FMPC has been the location of various industrial processes associated with the production of uranium metal. As a result of these processes, radiological contaminants exist at numerous outdoor and indoor locations at the FMPC. This radiological contamination occurs in both process and nonprocess areas of the Feed Materials Production Center (FMPC). In 1989, the mission at the FMPC changed from a uranium production mode to a site clean-up and remediation mode.

Semi-Annual, Routine, Special Request, and Characterization radiological surveys performed by WMCO's IRS&T Radiological Safety organization have identified locations in both process and nonprocess areas where radiological activity levels higher than both DOE and WMCO Administrative Guides exist. Additional radiological surveys are ongoing in both process and nonprocess areas. The identification of additional areas where activity levels exceed DOE and WMCO Administrative Guides are anticipated.

At present WMCO has committed to a 20% reduction of total process areas which exceed 1000 dpm/100 cm² alpha and 5000 dpm/100 cm² beta by 9/30/91. Similarly, WMCO has committed to a 100% reduction of total nonprocess areas which exceed 5000 dpm/100 cm² beta.

This decontamination will be accomplished by the existing Industrial Cleaning Crew and other FMPC employees. The decontamination will be accomplished in accordance with established and proposed site policies and procedures. Controlled and Radiological Areas shall be posted in accordance with the provisions in DOE Order 5480.11.

As a result of the cleaning and decontamination, it is anticipated that radiologically contaminated wastes will be generated. Additionally other decontamination wastes which may have toxic or hazardous characteristics may be generated. All waste materials will require assessment in order to adequately characterize the nature of the material prior to proper disposal.

This Removal Site Evaluation (RSE) has been completed by the DOE under authority delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). This Removal Site Evaluation (RSE) is being conducted to determine whether conditions are present to warrant the implementation of a removal action. This removal site evaluation consists of an evaluation of the factors defined in Section 300.415 of the NCP which are to be considered in determining the appropriateness of a removal action.

SOURCE TERM

The source term for this RSE consists of one of two areas of the plant: the process area where work with radiological materials was performed, and the nonprocess area where administrative offices and other support functions are performed. The source term for each area is discussed separately below. This RSE is intended to address activities necessary to accomplish decontamination of selected structures. No demolition of structures will occur. This RSE addresses decontamination of both fixed and removable contamination in the nonprocess area and reduction by an initial 20 percent of the contaminated surfaces in the process areas. Those structures known to be contaminated with Uranium and its daughter products were selected in order to simplify assessment. This RSE is intended to provide for minor decontamination activities. Beyond a significant reduction of contaminated areas at FMPC, relevant data obtained from this RSE will be available to more accurately scope further remediation activities. No disturbance of soils will be performed as part of this project. Contaminated soils will be remediated under the CERCLA Program.

Process Area - Radioactive contamination exists within numerous process area buildings and plants. This contamination consists of radiologically contaminated particles which are emitting alpha, beta and gamma activity. These particles adhere to surfaces within the plants and in outdoor areas. The material composition of the surfaces are variable but include: concrete, gravel, metal, painted surfaces and inplant floors, side walls and ceiling structures.

A review of available historical site data for process areas indicates that the probable source for the releases of the contaminated materials cannot be correlated to a specific release event. Rather, the various uranium material and uranium wastes handling, production and storage activities and day-to-day activities (analytical laboratory work, etc.) at the FMPC have contributed substantially to the presence of the contamination.

Radiological surveys conducted by direct frisk have shown alpha activity levels which range from 200-35,000 dpm/100 cm². Beta contamination ranges from 1,000 - 500,000 dpm/100 cm². Radiological contamination has been identified in the following locations:

Pilot Plant	Plant 5
Plant 1	Plant 6
Plant 2/3	Plant 8
Plant 4	Plant 9

Figure 1 of this RSE shows the total area (in square feet) of each location and the total area known to be contaminated. The radiological contamination data suggests that most of the contamination is removable. These areas will be decontaminated to less than 1000 dpm/100 cm² removable alpha and less than 5,000 dpm/100 cm² removable beta per DOE Order 5480.11, Attachment 2.

Proposed decontamination techniques for all process areas are to consist of cleaning of particulates initially with HEPA vacuum cleaners and other dry cleaning/removal methods. Following each area cleaning, a follow-up radiological survey with radiological swipes and "direct frisk" by portable instruments will be performed to determine the adequacy of decontamination. Further cleaning with liquid soap solutions will be used as necessary.

The contaminated wastes to be generated by the decontamination activities will consist of solids and liquids. Wastes will be managed in accordance with radiological characterizations consistent with FMPC site policies and procedures. All solid wastes generated will be placed in metal waste containers and located at a satellite accumulation area pending RCRA determination analysis. All liquid wastes generated will be placed in leak proof metal waste containers and located at a satellite accumulation area pending RCRA determination analysis. Waste materials will be dispositioned in accordance with FMPC site procedures.

Nonprocess Area - Contamination has been identified at several locations on the nonprocess side at the FMPC. The contamination is fixed. The contamination has become fixed by a variety of methods which include:

1. Painting of radiologically contaminated surfaces in the past.
2. Radioactive particles adhering to semi-solid adhesive surfaces such as window caulking, asphalt, roof tars and tar existing in concrete side walk expansion joints.
3. Wax application over floor tiles which have radiological particulates entrapped between tile cracks.

4. Radiological particulates entrapped in duct work and floor drains.

Radiological surveys conducted have shown beta levels in the nonprocess areas which range from 5,000 - 140,000 dpm/100 cm². These levels will need to be reduced to < 5,000 dpm/100 cm² in order to remain an "Uncontrolled Area" per DOE Order 5480.11. Figure 2 shows the contamination levels that have been measured in nonprocess areas. The data is displayed on 6 sheets. This data is also tabulated in the Survey Results Tables T1 through T15 that accompany this RSE.

As stated in the introduction of this RSE, WMCO has committed to a 100% reduction of total nonprocess areas which exceed Uncontrolled Area requirements as defined by DOE Order 5480.11 by 09/30/91.

Areas shown by radiological survey to be contaminated include:

- o Administration Building
- o North Side Cafeteria
- o Human Resources Building
- o Laboratory
- o Security Shacks and Turnstiles
- o Service Building
- o Building Roofs
- o Various Outside Locations (gravel, outside of buildings)
- o Walk Ways

Selected locations such as offices, ducts, windows, utility rooms, storage areas, floor drains, floors, equipment, vents, doors, shelves and covers have shown radiological contamination which exceeds DOE and WMCO Administrative Guides for Surface Radioactivity.

Nonprocess area decontamination activities in general will consist of a three stage manual cleaning process; primary, secondary and tertiary. Each successive stage shall be increasingly more abrasive. The stages progress from primary being the least harsh and abrasive to tertiary being the most harsh and abrasive. Most of the contamination is removable with HEPA vacuum cleaners, other dry cleaning/removal methods or cleaning with liquid soap solutions. Nonprocess area decontamination activities proposed may involve the removal of some materials. However, the decontamination stages are designed to be no more destructive than for example: scraping painted surfaces, scrubbing stained surfaces, or routing fill material from cracks or other locations where contaminated materials have accumulated over the life of the facility. Individually each project will generate small amounts of waste consisting of paint, wax, etc. particles and rinse water.

Decontamination of the nonprocess areas will be highly dependent upon the nature of how the fixed contamination is entrapped. Relatively nonporous surfaces such as concrete, metal, painted surfaces and tile could be decontaminated by a combination of surface cleaning or physical removal of all or part of the exposed contaminated surfaces. Examples would include removal of tiles and cleaning of the underlying surface if necessary. In many cases, dry and liquid cleaning, as proposed for the contaminated process areas, should be adequate for the nonprocess areas.

Following each area decontamination a follow-up radiological survey will be performed to determine the adequacy of decontamination.

If post decontamination radiological survey results continue to display contaminant levels greater than WMCO and DOE Administrative Guides, then clearly further decontamination will be necessary. Further decontamination may involve some demolition or replacement of contaminated material. This activity is beyond the scope of the decontamination proposed under this RSE. Thus, if the three stage manual cleaning proposed in this RSE does not result in effective decontamination, further decontamination will not be performed under this RSE. It will be addressed under a separate action for those areas not able to be decontaminated.

The contaminated wastes to be generated by the decontamination activities will consist of particulates, refuse and liquids. Wastes will be managed in accordance with radiological characterizations consistent with FMPC site policies and procedures. All solid wastes generated will be placed in metal waste containers and located at a satellite accumulation area meeting 40 CFR 262 requirements for satellite areas pending RCRA determination analysis. All liquid wastes generated will be placed in leak proof metal waste containers and located at a satellite accumulation area pending possible RCRA determination analysis. Waste materials will be dispositioned in accordance with FMPC site procedures. In office areas process knowledge may be used for RCRA determination. Waste materials will be dispositioned in accordance with FMPC site procedures.

A review of available historical site data for nonprocess areas indicates that the probable source for the release of the contaminated materials cannot be correlated to a specific release event. Rather, the various uranium material and uranium wastes handling, production and storage activities and resultant airborne releases from the process area coupled with inadequate contamination control in the past, have contributed to the presence of contamination in the nonprocess area. Additional contributory factors include nonprocess area activities such as the laboratory operation or interconnected air and water conveyance (transfer) systems.

EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

Process area decontamination activities proposed at this time are limited to removal by manual procedures. This removal will be performed inside process buildings thus minimizing environmental release of contamination.

The radiological contaminant sources are uranium-238 and its daughters deposited as a result of the production activities performed at the FMPC. While there is limited external radiation exposure associated with these isotopes, there is concern for:

- o Internal radiation dose due to inhalation or ingestion.
- o The entrainment of uranium isotopes into the atmosphere during decontamination activities is the primary potential exposure.
- o Potential exposure of secondary concern is the liquid wastes associated with wet decontamination activities.

Proper air, solid and liquid engineered controls utilized during decontamination activities will be employed to keep occupational and environmental exposure to a minimum. These controls are discussed in the following section of this document.

As a result of the cleaning and decontamination, it is anticipated that radiologically contaminated wastes will be generated. Contaminated material encountered will be dispositioned as solid waste. Additionally other decontamination wastes which may have toxic or hazardous characteristics may be generated. Examples include asbestos and lead. All waste materials will require assessment in order to adequately characterize the nature of the material prior to proper disposal. However, all solid waste will be containerized as stated earlier.

The decontamination proposed for the nonprocess area will occur mainly within buildings such as offices, ducts, windows, utility rooms, storage areas, floor drains, floors, equipment, vents, doors, shelves and covers, thus minimizing environmental release. In addition to the indoor work, the decontamination proposed is to include: sidewalk expansion joints and the areas at the security turnstiles.

All personnel involved in the decontamination effort will abide by the FMPC Health and Safety Plan and the Project/Task Specific Health and Safety Plan to aide in the effective control of potential health and safety hazards.

In order to minimize the potential for releases during decontamination, additional control measures will be instituted for both process and nonprocess areas as follows:

1. Particulate engineered safeguards will be used where necessary to control particles suspended in the atmosphere at and adjacent to work areas such as portable HEPA Filters, containments, etc.
2. The disposition of contaminated waste materials generated shall be in accordance with site policies and procedures and per the specific requirements noted within this RSE document and consistent with site posting procedures. The disposition will also be in compliance with applicable local, state and federal regulations and with Applicable or Relevant and Appropriate Requirements (ARARs) as identified for Operable Unit #3.
3. All contaminated waste materials generated shall be placed into metal waste containers and located at a satellite accumulation area pending RCRA determination analysis. The materials shall be segregated by categories as defined in site policy FMPC-720 as it is placed in the metal waste containers to facilitate proper dispositioning upon receipt of the RCRA determination.
4. Dispositioning/handling of contaminated waste materials shall be performed during non-peak personnel traffic times, and/or by using an appropriate personnel detour route away from the work area. When possible, work will be done on 2nd or 3rd shift to effectively eliminate nearby population risk.
5. Good housekeeping rules, all applicable policies and procedures, and appropriate Health and Safety measures will be maintained at the work area and adjacent areas. The work will also be in compliance with applicable local, state and federal regulations and with Applicable or Relevant and Appropriate Requirements (ARARs) as identified for Operable Unit #3.

ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the National Contingency Plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b) (2). The following apply specifically to the decontamination activities proposed for the process and nonprocess areas:

40 CFR 300.415 (b) (2) (i)

Actual or potential exposure to hazardous substances or pollutants or contaminants to nearby populations, animals, or food chain.

40 CFR 300.415 (b) (2) (v)

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

40 CFR 300.415 (b) (2) (viii)

Other situations or factors which may pose threats to public health or welfare or the environment.

- o Due to the scope of the projects for decontamination, other situations or factors are unknown at this time .

The small number of site personnel at risk, the relatively low levels of radiological contaminations, the containment of the work to be done, and the low potential for contaminants to migrate to nearby populations, show that this is not a removal action.

Rather than a removal action, this activity more logically represents an ongoing housekeeping or maintenance action.

- o Most of the contamination is removable by HEPA vacuum cleaners, other dry cleaning/removal methods or cleaning with liquid soap solutions.
- o The decontamination effort is designed to be no more destructive than for example: scraping painted surfaces, scrubbing stained surfaces, or routing fill material from cracks or other locations where contaminated materials have accumulated over the life of the facility.
- o Individually each project will generate small amounts of waste consisting of paint, wax, etc., particles and rinse water.

The primary reason for doing this project is not because of imminent risk to personnel, but to comply with WMCO/DOE commitments and orders which emphasize strict contamination control measures and good health physics practices to maintain the potential for release as low as reasonably achievable (ALARA).

APPROPRIATENESS OF A RESPONSE

If a planning period of less than six months exists prior to initialization of a response action, DOE will issue an Action Memorandum. The Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, DOE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat to public health and the environment and to evaluate viable alternative response actions. It will also serve as a decision document to be included in the Administrative Record.

Based on the evaluation of all of the above factors, it has been determined that existing controls for the planned action are adequate and a removal action is not required.

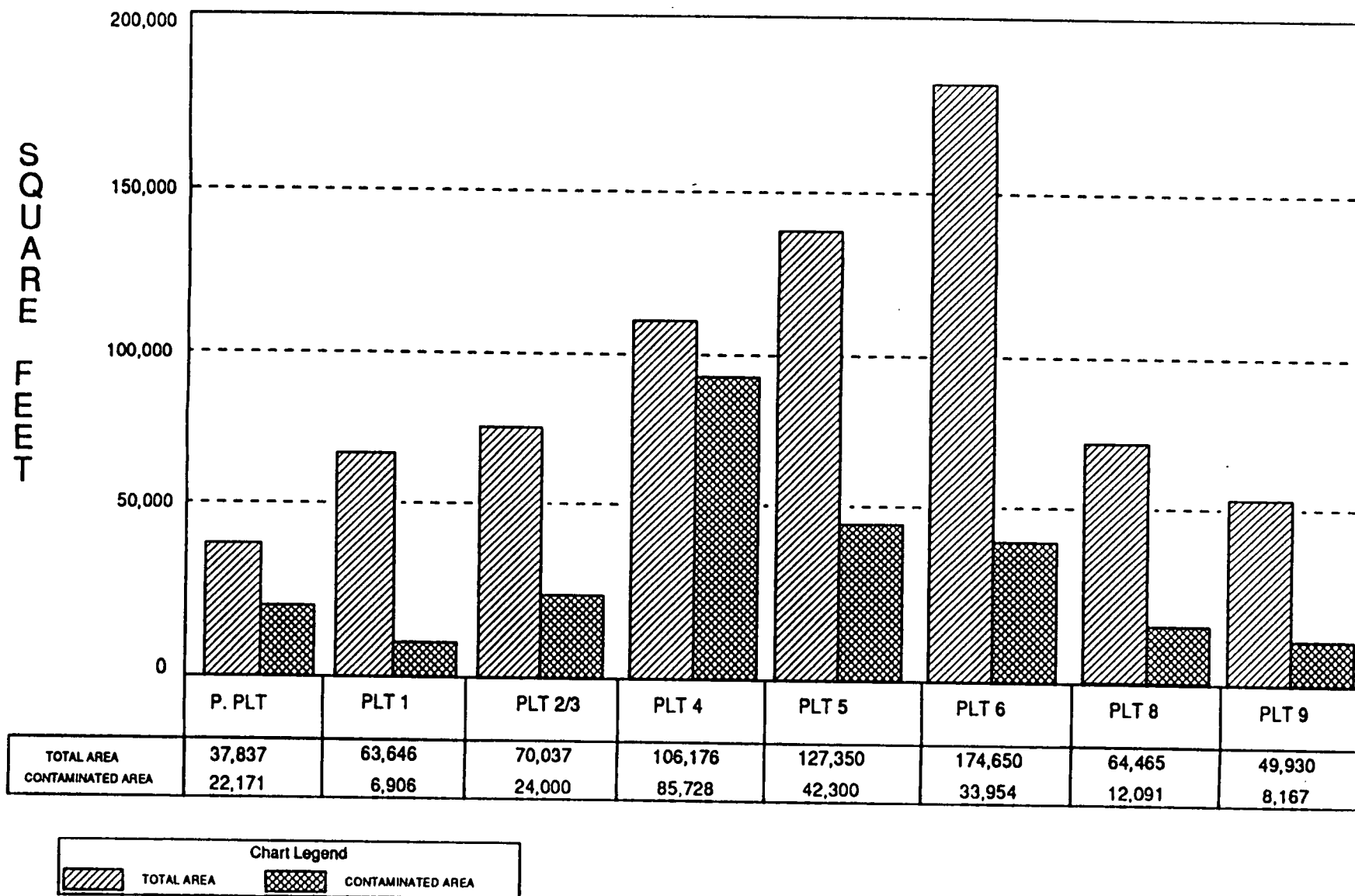
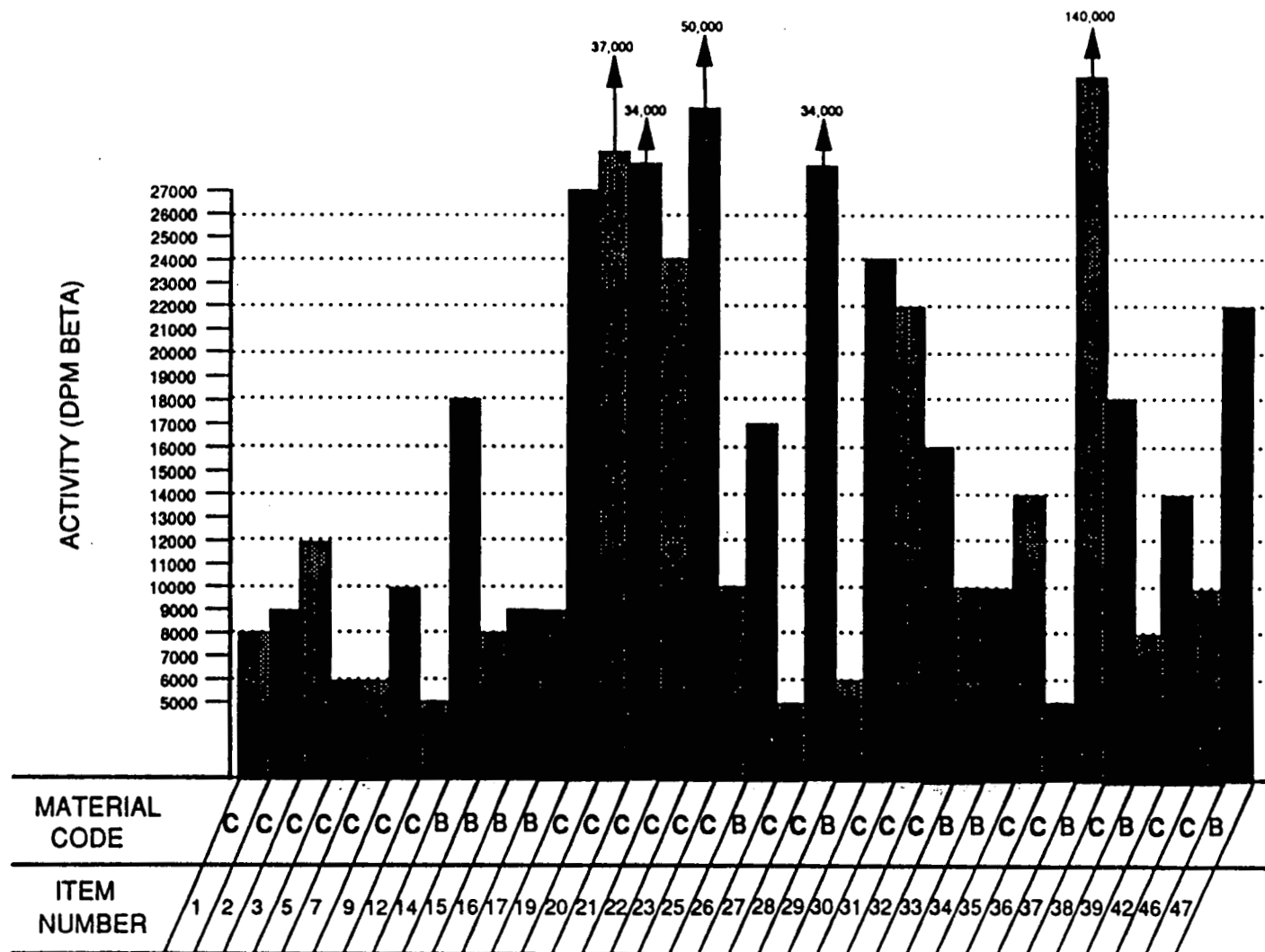


Figure 1. Process Area Chart Showing Total Area and Contaminated Area - 1991.

SIDEWALK RADIOLOGICAL SURVEY RESULTS



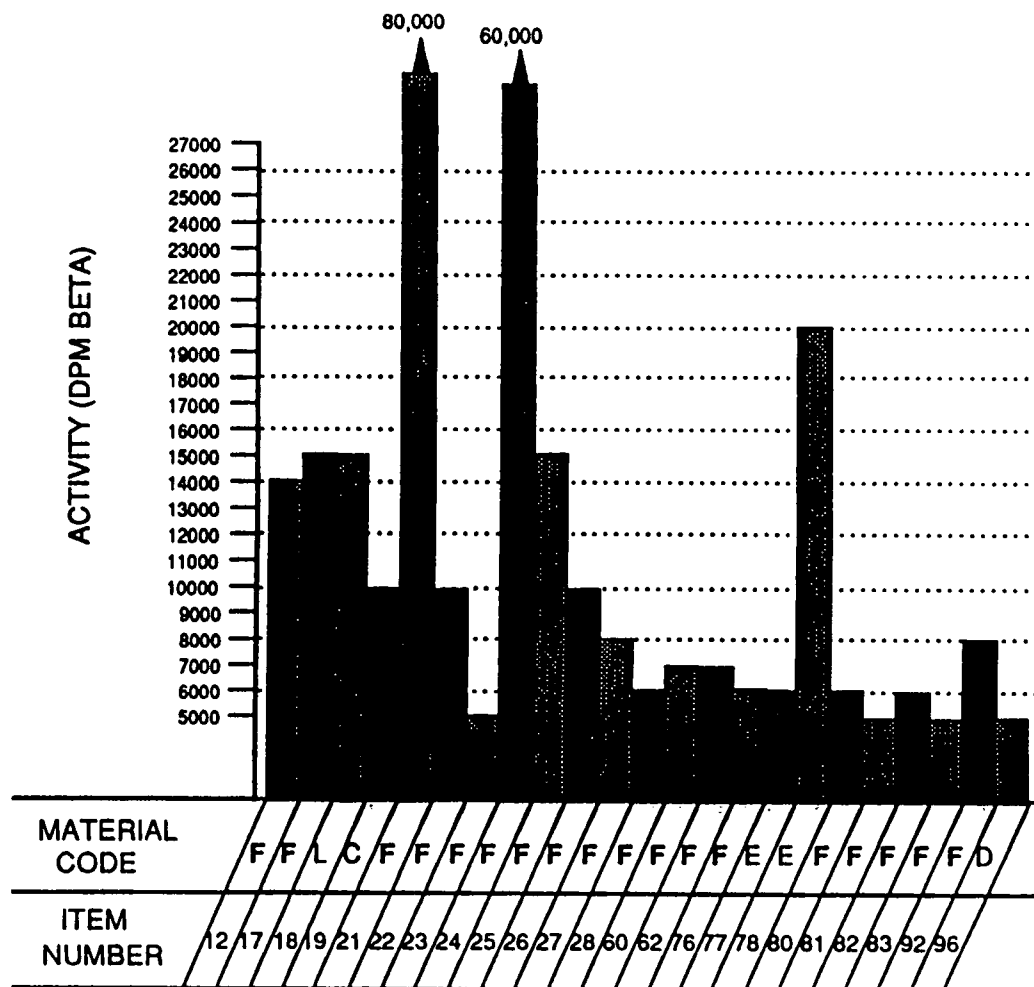
** THIS CHART SHOWS THE RESULTS OF A SURVEY CONDUCTED 6-9-90 OF VARIOUS OUTSIDE AREAS.

MAT. CODES
 C = CRACK (SIDEWALK)
 B = BLOCK (SIDEWALK)

Figure 2. Nonprocess Side Data (Sheet 2 of 6)

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NORTH SIDE CAFETERIA RADIOLOGICAL SURVEY RESULTS



** THIS CHART DISPLAYS RESULTS OF RADIATION SURVEY DONE ON 1-23-90

MAT. CODES

F = FLOOR
L = LEDGE
C = CABINET
D = DOOR
E = ELEVATOR

Figure 2. Nonprocess Side Data (Sheet 3 of 6)

SECURITY SHACKS/TURNSTILES RADIOLOGICAL SURVEY RESULTS

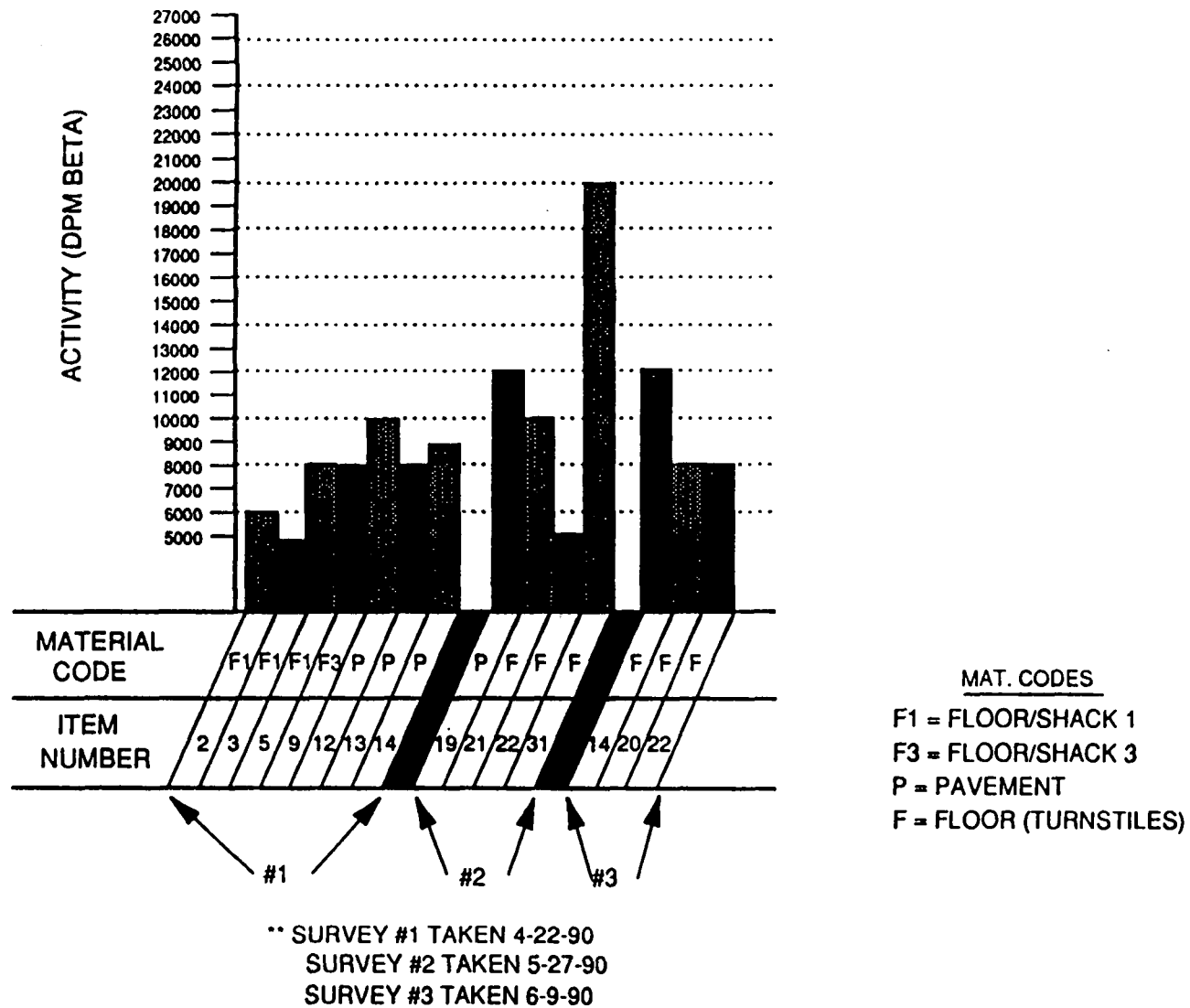
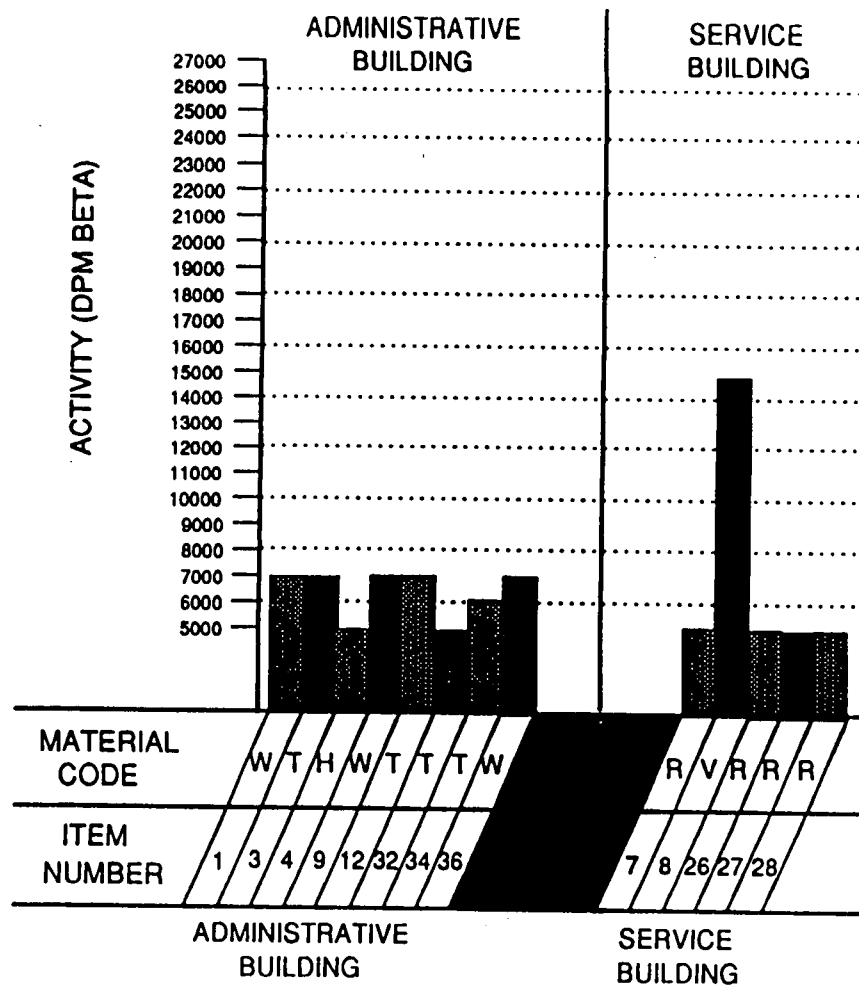


Figure 2. Nonprocess Side Data (Sheet 4 of 6)

ADMINISTRATIVE BLDG & SERVICE BLDG RADIOLOGICAL SURVEY RESULTS



ADMINISTRATIVE BLDG ROOM NUMBERS

ITEM 1 - 114D
ITEM 3 - MENS ROOM
ITEM 4 - MENS ROOM
ITEM 9 - 14-130
ITEM 12 - 28-52
ITEM 32 - 14-19
ITEM 34 - CASHIER AREA
ITEM 36 - CASHIER AREA

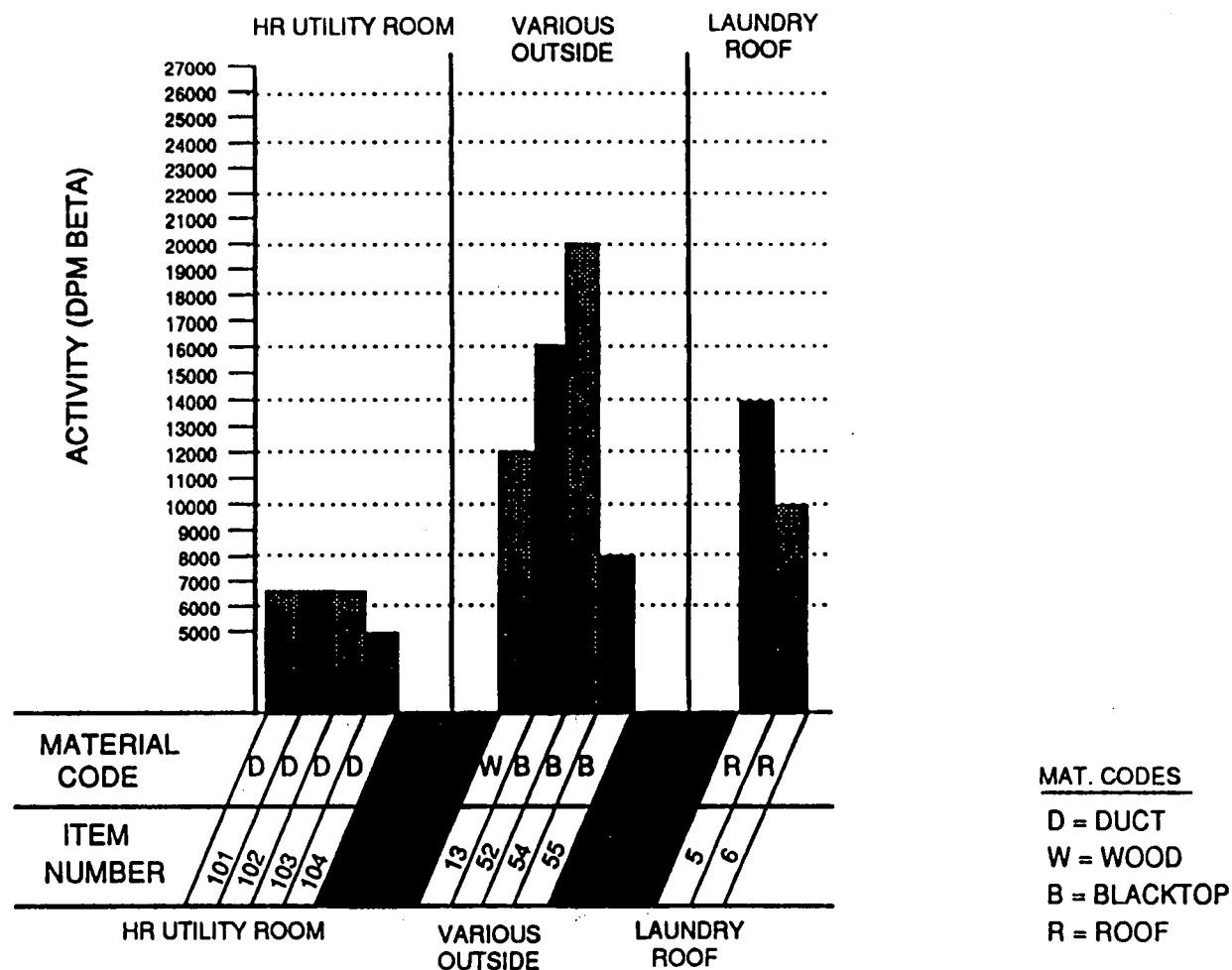
MAT. CODES

W = WINDOW
T = TRACK (WINDOW)
H = HINGE (WINDOW)
R = ROOF
V = VENT

** SURVEY OF ADMINISTRATIVE BLDG ACCOMPLISHED 1-14-91
SURVEY OF SERVICE BLDG ACCOMPLISHED 6-15-90

Figure 2. Nonprocess Side Data (Sheet 5 of 6)

HUMAN RESOURCES UTILITY ROOM, VARIOUS OUTSIDE LOCATIONS, & LAUNDRY ROOF RADIOLOGICAL SURVEY RESULTS



** SURVEY OF HR UTILITY ROOM DONE 7-19-90
 SURVEY OF VARIOUS OUTSIDE LOCATIONS DONE 6-9-90
 SURVEY OF LAUNDRY ROOF DONE 6-8-90

Figure 2. Nonprocess Side Data (Sheet 6 of 6)

SURVEY RESULT TABLES

<u>LOCATION</u>	<u>PAGE</u>
Administration Building	T 1
Cafeteria	T 2
Human Resources Utility Room	T 3
Laboratory	T 4
Laundry Roof	T 9
Security Turnstiles	T10
Service Building	T13
Various Outside Locations	T14

CAFETERIA
1-23-90 / 1530 HRS

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
F	NA	12	14000
F	NA	17	15000
L	NA	18	15000
C	NA	19	10000
F	NA	21	80000
F	NA	22	10000
F	NA	23	5000
F	NA	24	60000
F	NA	25	15000
F	NA	26	10000
F	NA	27	8000
F	NA	28	6000
F	NA	60	7000
F	NA	62	7000
F	NA	76	6000
EL	NA	77	6000
EL	NA	78	20000
F	NA	80	6000
F	NA	81	5000
F	NA	82	6000
F	NA	83	5000
F	NA	92	8000
DR	NA	96	5000

MATERIAL CODES:

- F - FLOOR
- L - LEDGE
- C - CABINET
- DR - DOOR
- EL - ELEVATOR

HUMAN RESOURCES UTILITY ROOM
7-19-90 / 2345 HRS

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
D	NA	101	6500
D	NA	102	6500
D	NA	103	6500
D	NA	104	5000

MATERIAL CODES: D - DUCT

LABORATORY
11-4-90 / 0930 HRS

[illegible]

T-4

LABORATORY 11-4-90

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPN BETA)
F	C-1	23	6000
F	C-4	24	12000
F	C-4	25	6000
F	C-7	26	22000
W	C-7	27	10000
W	C-11	28	15000
W	C-11	29	20000
F	C-11	30	10000
W	C-12	31	6000
W	E-9	32	6000
F	E-29	33	9000
F	E-39	34	6000
F	E-39	35	15000
DR	E-39	36	10000
W	E-39	37	8000
F	E-41	38	10000
F	E-41	39	10000

MAT. CODES: F - FLOOR
W - WINDOW
DR - DRAIN PLUG

LABORATORY 11-4-90

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPN BETA)
F	S-8	1	8000
F	S-12	2	6000
F	S-18	3	6000
F	S-18	4	8000
F	S-18	5	10000
F	S-20	6	8000
DP	S-21	7	6000
DP	S-21	8	8000
F	S-21	9	22000
F	S-21	10	26000
F	S-21	11	8000
F	S-25	12	8000
F	S-25	13	7000
F	S-27	14	20000
F	S-27A	15	6000
F	S-28	16	10000
F	S-30	17	5000
F	S-30A	18	6000
F	S-33A	19	13000
F	S-35	20	6000
F	S-38	21	9000
F	S-38	22	13000

MAT. CODES: F - FLOOR
 DP - DECK PLATE

LABORATORY
3-29-91

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
F	E-21	42	10000
CM	E-23	43	8000
F	E-23	44	15000
W	E-23	45	15000
DR	E-41	47	5000
S	E-41	48	5000
PD	E-41	49	5000
F	S6A	51	10000
F	E-39	89	5000
D	E-39	91	12000
DR	E-39	93	5000
WL	E-39	94	8000
WL	E-39	95	8000

MATERIAL CODES:

F - FLOOR
D - DRAIN PLUG
DR - DRAIN
WL - WINDOW LEDGE

S - SINK
PD - PIPE DRAIN
CM - COMPUTER MODULE
W - WINDOW

SECURITY TURNSTILES
5-27-90 / 0530 HRS

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
P	NA	19	12000
F	NA	21	10000
F	NA	22	5000
F	NA	31	20000

MATERIAL CODES: F - FLOOR
 P - PAVEMENT

SECURITY TURNSTILES
6-9-90 / 0138 HRS

[illegible]

MATERIAL CODES: F - FLOOR

SERVICE BUILDING
6-15-90 / 1530 HRS

NAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
V	NA	8	15000
R	NA	26	5000
R	NA	27	5000
R	NA	28	5000

MATERIAL CODES: R - VENT
 V - VENT

**VARIOUS OUTSIDE LOCATIONS
6-9-90 / 0730 HRS**

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPN BETA)
SC	NA	1	8000
SC	NA	2	9000
SC	NA	3	12000
SC	NA	5	6000
SC	NA	7	6000
SC	NA	9	10000
SC	NA	12	5000
W	NA	13	12000
CB	NA	14	18000
CB	NA	15	8000
CB	NA	16	9000
CB	NA	17	9000
SC	NA	19	27000
SC	NA	20	37000
SC	NA	21	34000
SC	NA	22	24000
SC	NA	23	50000
SC	NA	25	10000
CB	NA	26	17000

MATERIAL CODES: W - -WOOD
 CB - CONCRETE BLOCK
 SC - SIDEWALK CRACKS

**VARIOUS OUTSIDE LOCATIONS
6-9-90 / 0730 HRS**

MAT. CODE	ROOM NUMBER	ITEM NUMBER	ACTIVITY (DPM BETA)
SC	NA	27	5000
SC	NA	28	34000
CB	NA	29	6000
SC	NA	30	24000
SC	NA	31	22000
SC	NA	32	16000
CB	NA	33	10000
CB	NA	34	10000
SC	NA	35	14000
SC	NA	36	5000
CB	NA	37	140000
SC	NA	38	18000
CB	NA	39	8000
SC	NA	42	14000
SC	NA	46	10000
CB	NA	47	22000
BT	NA	52	16000
BT	NA	54	20000
BT	NA	55	8000

MATERIAL CODES: BT - BLACKTOP
CB - CONCRETE BLOCKS
SC - SIDEWALK CRACKS

ITEMS NUMBERS 1 - 24 WERE TAKEN ON SIDEWALK EAST OF LABORATORY
25- 58 WERE TAKEN WORKING WEST TO EAST FROM LABORATORY ACROSS
FRONT OF SERVICE BUILDING.